

Appl. No. 10/577,510
Reply to Office Action of April 19, 2010

Amendments to the Drawings:

The attached sheets of drawings include changes to Fig. 1 and Fig. 2. The attached sheets replaces the original sheets for Fig. 1 and Fig. 2. In each of Fig. 1 and Fig. 2, the term "PRIOR ART" was added.

Attachments: Replacement Sheets
Annotated Sheets Showing Changes

REMARKS/ARGUMENTS

New Claims

All the pending claims were cancelled and were replaced with new claims 24 to 37.

The new claims are based on an embodiment with a) a two step vaporization, and/or with b) a partial pressure regulating means (or portion) and a two step condensing means (or portion).

For embodiment a) (see new claim 24), the gas separated by condensing the medium contact the liquid medium and vaporize it to thereby incorporate the vaporized medium in two steps of a first and a second vaporizing means. Further the gas vaporized in the first vaporizing means also incorporates vaporized medium by contacting the liquid medium in the second vaporizing means (see page 14, lines 30 to 34; the paragraph bridging page 14, line 35 to page 15, line 2; and page 19, lines 1 to 4 of the present specification). Therefore, the efficiency of vaporizing the liquid medium and condensing-separating can be improved.

For embodiment b) (see new claim 25), a partial pressure regulating means regulates the partial pressure of the vaporized vapor by controlling the flow rate of the vaporized vapor returning to the vaporizing means through a (bypass) pipe (see

page 38, lines 10 to 26 of the present specification).

Therefore, the vaporizing means is safe from bumping even when operated with the condensing means and fed with (carrier) gas from the condensing means, which makes the system pressure more and more reduced as the vaporized medium is condensed and removed from the gas-phase.

Features from previous claims 11 and 12 are recited in new claims 24 and 25, along with additional features.

New claim 26 recites the feature of previous claim 13.

New claim 27 includes features recited in new claim 24 and includes features of previous claims 14 and 15.

New claim 28 includes a feature of "flow down an outer surface of the spiral pipe and an inner wall of the distilling portion", which is supported on page 39, lines 32 to 36 of the specification.

New claim 29 includes features recited in previous claim 16.

New claim 30 includes features recited in previous claim 17.

New claim 31 includes features recited in previous claim 18.

New claims 32 and 33 recite the features of previous claims 20 and 21.

New claims 34 to 37 recite the features of previous claims 21 to 23.

Objection to the Abstract

The Abstract was objected to for the reasons set forth at the middle of page 2 of the Office Action.

A replacement Abstract of the Disclosure is submitted concomitantly herewith.

Withdrawal of objection to the Abstract is respectfully requested.

Drawings

The drawings were objected to under 37 CFR 1.83(a) for the reasons set forth on pages 2 to 3 of the Office Action.

Following the Examiner's request, Figs. 1 and 2, were amended to include the term "PRIOR ART".

The position was taken in the Office Action that the "supplying means" recited in previous claims 19 and 20 must be shown in the drawings or cancelled from the claims.

New claims 27, 32 and 33 recite a "supplying portion". A "supplying means" or "supplying pipe" is disclosed on page 30, lines 28 to 33 and page 38, lines 10 to 26 of the specification.

The supply pipe is shown in Fig. 5 as item 1032. Accordingly, the drawings show the "supplying means".

Withdrawal of the objection to the drawings is respectfully requested.

Rejection under 35 USC 112, Second Paragraph

Claims 14 to 23 were rejected under 35 USC 112, second paragraph, for the reasons set forth on pages 3 to 4 of the Office Action.

It is respectfully submitted that the above new claims serve to avoid the 35 USC 112, second paragraph rejection.

Withdrawal of the 35 USC 112, second paragraph rejection is respectfully requested.

Prior Art Rejections

Rejection Under 35 USC 102/35 USC 103

Claims 11 to 12 and 14 to 16 were rejected under 35 USC 102 as being anticipated by or, in the alternative, under 35 USC 103 as obvious over JP 55-102401 for the reasons set forth in the paragraph bridging pages 4 to 5 of the Office Action.

Obviousness Rejections Under 35 USC 103

Claims 13 and 17 to 18 were rejected under 35 USC 103 as being unpatentable over JP 55-102401 in view of Neal et al. (USP 4,983,260) for the reasons set forth in the paragraph bridging pages 5 to 6 of the Office Action.

Claims 19 to 23 were rejected under 35 USC 103 as being unpatentable over JP 55-102401 in view of Neal et al. (USP 4,983,260) as applied to claims 11 to 18 above, and further in view of Sussmeyer et al. (USP 4,584,062) for the reasons set forth on page 6 of the Office Action.

It is respectfully submitted that none of the cited references do not teach or suggest the problems solved by the presently claimed invention and the advantageous results provided by applicants' new claims.

Arguments for the Patentability of Applicants' Present Claims

Applicants' Claims 24 and 27

Applicant present claims 24 and 27 include the features of a first vaporizing means and a second vaporizing means.

In the first vaporizing means, a first gas is forcibly blown into a mixture to vaporize a liquid medium contained in the mixture.

In the second vaporizing means, the mixture containing the liquid medium is dropped into the second vaporizing means and the mixture is counter-flowingly contacted with a second gas which is fed from a lower part of the second vaporizing means.

This two step vaporization makes it possible to effectively vaporize the liquid medium. Such an effective vaporization results in a high recovery-rate of the liquid medium contained in the mixture.

None of the cited references disclose such feature of a two step continuous vaporization. Accordingly, it is respectfully submitted that applicants claims 24 and 27 (including all the claims that depend on claims 24 and 27) patentably distinguish over the cited references, alone or combined in the manner set forth in the Office Action.

Applicants' Claims 25 and 29

Applicants' claims 25 and 29 include a feature of a partial pressure regulating means (portion).

In the partial pressure regulating means, a part of the first gas and the vaporized liquid medium discharged from the vaporizing means is returned to the vaporizing means through a conduit means. The conduit means is comprised of a circulation

pipe connected to the vaporizing means (the circulation pipe corresponds to the pipe "1032" in Fig. 5).

According to the presently claimed invention, the partial pressure of the vaporized liquid medium is able to be regulated by controlling the flow rate of the vaporized liquid medium returning to the vaporizing means through the conduit means. Such a regulation makes it possible to operate the vaporizing means more safely and stably, since the liquid medium in the vaporizing means can be prevented from bumping or boiling by controlling the partial pressure of the vaporized liquid medium.

None of the cited references disclose such a feature of the regulation of the partial pressure of a vaporized liquid medium. Accordingly, it is respectfully submitted that applicants claims 25 and 29 (including all the claims that depend on claims 25 and 29) patentably distinguish over the cited references, alone or combined in the manner set forth in the Office Action.

Withdrawal of each prior art rejection is respectfully requested.

The USPTO fee for \$104 for two additional claims is being paid by credit card herewith.

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Reconsideration is requested. Allowance is solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

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Respectfully submitted,



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Encs.: Petition for Extension of Time
Replacement Sheets (2 sheets - Fig. 1 and Fig. 2)
Additional Fee for 2 extra claims - \$104